

REMARKS

Claims 1, 5-7, 11-20, 22-24, 29 and 30 are pending. Claims 2, 3, 4, 8, 9, 10, 21 and 25 to 28 have been canceled. Claims 23 to 29 have been withdrawn from consideration. No claims have been added. Claims 1, 11, 12, 13, 14, 15, 18, 23, 24 and 30 are amended. Basis for the amendment to claim 1 may be found on original claim 2. Basis for the amendment to claim 30 may be found on page 6, lines 4-5. Claims 11, 12, 13, 14, 15, 18, 23 and 24 are amended to be consistent with claim 1.

§ 112 Rejections

Claims 1 stands rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The rejection is traversed.

The Office Action asserts that the recitation “a hydrophilic articlesurfactants that migrates to said first surface of said polymeric layer” is not clear whether in the final the adhesive is present in the adhesive layer or not. For the purpose of examination, the claim has been interpreted as “any reference teaching a thermoplastic polymer layer with an adhesive bonded to one surface of the thermoplastic layer wherein a nonionic fluorochemical surfacatant is on the first surface of the polymer layer. This is an incorrect interpretation, and contrary to Applicant’s disclosure.

In making the rejection, the Examiner has not met the requirements of M.P.E.P 2173.02 which state:

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and

(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In particular, the Office Action has given no consideration to the content of the instant disclosure. In claim 1, the term “hydrophilic” is clear, as Applicants have defined the term as exhibiting a water contact angle of $< 90^\circ$. The Examiner appears to most troubled by Applicant’s use of the functional limitation of a “surfactant that migrates to said first surface of said polymeric layer”. Here too, the Examiner ignores the requirements of M.P.E.P. 2173.05(g) which states “[t]here is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971). A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step”.

Briefly, claim 1 defines a hydrophilic article (defined by the water contact angle) having a polymer layer, and an adhesive layer having a surfactant dispersed therein. As taught on page 3, lines 23-24 “dispersed therein” denotes merely the initial presence of the surfactant in the adhesive layer without limitation as to where the surfactant may subsequently migrate. The polymer layer is initially hydrophobic. Subsequent to the manufacture of the article, the surfactant migrates from the adhesive layer, crossing the adhesive/thermoplastic polymer interface, and through the thermoplastic polymer layer to the surface thereof. Thus the functional limitation refers to a dynamic process of migration whereby the adhesive layer serves as a reservoir of surfactant to continually renew the surfactant on the surface of the thermoplastic polymer layer as it is depleted.

Since this is believed to be a diffusion process it is assumed that Fick’s Second Law applies, such that there is an effective diffusion coefficient (D) that is not concentration dependent, then for 1 dimensional diffusion of a species into a semi-infinite medium, the solution of

$$\partial C / \partial t = D(\partial^2 C / \partial x^2) \quad [\text{Fick's 2}^{\text{nd}} \text{ law}]$$

where $C = C_0$, $x = 0$, $t > 0$ [boundary condition]

and $C = 0$, $x > 0$, $t = 0$ [initial condition]

is found to be

$$C = C_0(\text{ERFC}[x/(4Dt)^{1/2}]),$$

where C is the concentration of the diffusing species, t is time, x is the coordinate of the diffusion direction, and ERFC is the complementary error function. Reference may be made to The Mathematics of Diffusion, 2nd Edition, J. Crank, Clarendon Press, Oxford, 1975.

Therefore, one skilled in the art, aided by Applicant's disclosure, would understand that it is not appropriate to presume the surfactant is solely at the surface of the thermoplastic polymer, as the migrating surfactant may be found in the adhesive layer, in the polymer film matrix and on the surface of the polymer film layer. As claim 1 recites that the surface of the polymer layer is hydrophilic, sufficient surfactant has migrated from the adhesive layer to the surface of the adjacent polymer layer to provide the requisite hydrophilicity. Applicants have further provided an XPA/ESCA test described on pages 23 and 40-41 to measure the fluorine content of the surface of the film and thereby determine surfactant concentration.

In summary, Applicants submit that the rejection of claim 1 under 35 USC § 112, second paragraph, has been overcome, and that the rejection should be withdrawn.

§ 102/103 Rejections

Claims 1, 11 and 12 stand rejected under 35 USC § 102(b) as being anticipated by, or in the alternative under § 103(a) as obvious over U.S. 5,804,519 (Riswick et al.). The rejection is traversed in part and avoided in part by amendments presented herein.

Riswick et al. describe a hot melt adhesive containing a nonionic fluorochemical surfactant having improved "strike-through" properties, which are defined at column 1, lines 37-30 as the ability to transmit liquid from a nonwoven substrate into a superabsorbent or fluff core, such as is found in disposable diapers. The reference notes that when a coating of the hot melt adhesive is applied between a coverstock nonwoven and an absorption pad, the hydrophilic character of the hotmelt improves the strike-through properties. Simply, Riswick et al. describe a construction of nonwoven/hotmelt/absorbent, whereby a liquid is transmitted from the porous surface of the nonwoven into the absorbent. The migration of Applicant's surfactant would render the exposed

surface of the nonwoven layer hydrophilic, i.e. surface 125 of Figure 1. The reference is silent on the desirability of rendering the nonwoven substrate hydrophilic, as imparting hydrophilicity will tend to retain liquids rather than transmitting them away from the body and into an absorbent layer.

Claim 1 may be distinguished by the limitation of “film”, as amended herein. The reference disclosure is devoted solely to porous nonwovens and tissues, as described in column 1, lines 8 to 20, to allow the flow of fluid into the absorbent layer. Films are neither taught nor suggested, and would be precluded from such constructions such as diapers and sanitary napkins where a fluid must necessarily pass through the porous nonwoven layer adjacent the body.

In addition, the reference is silent on the limitation of migration. The reference provides no teaching or suggestion that the nonwoven layer is rendered hydrophilic due to the adjacent adhesive layer (containing a surfactant). The reference contact angles were measured on the adhesive *per se*, and not on the nonwoven substrate. Further, as the nonwoven is necessarily porous, the underlying adhesive is exposed, in part, in the interstitial spaces of the porous nonwoven, so that any liquid in contact with the nonwoven will necessarily contact the hydrophilic hotmelt through these interstitial spaces.

The rejection of 1, 11 and 12 under 35 USC § 102(b) as being anticipated by, or in the alternative under § 103(a) as obvious over U.S. 5,804,519 (Riswick et al.) has been overcome and should be withdrawn.

§ 103 Rejections

Claims 1, 5-7, and 11-15 stands rejected under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,625 (Temperante et al.). The rejection is traversed.

Applicants have previously argued that Koubek et al. is directed to water-borne, water-redispersible adhesives, notably styrene/acrylic acid copolymers, prepared by emulsion polymerization of the recited monomers in the presence of starch degradation products. The adhesive is useful for bonding a nonwoven substrate to a second substrate. At column 7, lines 13-25, the reference teaches that it may be desirable to add a surfactant to the adhesive “at conventional levels”. The reference provides no reason for the addition, and no guidance on what defines “conventional levels”, and no suggesting that the surfactants would migrate in the

reference article, nor that the surfactant would then impart a hydrophilic surface to the reference nonwoven substrate layer. Here, the Office Action relies on Applicant's own teachings of migratory surfactants to impermissibly make the rejection.

Claim 1 may be distinguished from Koubek et al. first in the limitation of a nonionic fluorochemical surfactant, which the Office Action notes is neither taught nor suggested by the reference. Further, there is no teaching or suggestion in the reference for the desirability of rendering the reference nonwoven substrate layer, or the second substrate layer, hydrophilic. The reference nonwoven substrates are described at column 7, lines 26 to 46. Some, such as the celluloses are naturally hydrophilic and would not be beneficially affected by a migratory surfactant, while others, such as the synthetic polymers are hydrophobic, and the use of a migratory surfactant to accomplish this is not contemplated by the reference. In making the rejection, the Examiner overlooks the burden required by M.P.E.P. 2143.01; that "the prior art must suggest the desirability of the claimed invention".

The Office Action avers that the deficiencies of Koubek et al. are provided by Temperante et al. Applicants disagree.

Temperante et al. is directed to hydrophilic, thermoplastic polymers in the form of fibers or films, the polymer mixture including one of more nonionic fluorochemical surfactants, and one or more non-fluorinated hydrophilic surfactants.

Were one to ignore the requirement that the teaching or suggestion of modifying the references come from the references themselves, and combine Koubek et al. with Temperante et al., as suggested in the Office Action, one would still not be in possession of Applicant's invention. Temperante et al. teach the addition of the recited surfactant to the molten thermoplastic polymer, as taught in reference column 8, lines 13 to 32. Thus, the reference polymers are rendered hydrophilic by direct addition to the melt, known in the art as "polymer melt additives". There is no teaching in Temperante et al. to add the reference surfactant mixture to an adhesive layer, as adhesives are not in the reference disclosure. Further, there is no teaching or suggestion for adding the surfactants of Temperante et al. to the water-borne, water-redispersible adhesives or either of the first and/or second substrates of Koubek et al.

The suggested combination would be the substitution of the hydrophilic polymers of Temperante et al., for the nonwoven substrate layer of Koubek et al. There is no basis in the

references for making such a substitution, nor any motivation for doing so, as Koubek et al provide no basis for the motivation cited by the Examiner.

With regard to claims 10 to 12 the Office Action asserts “it would be obvious....to add the amount of fluorochemical surfactant as disclosed by Temperante in the second nonwoven polyolefin substrate of Koubek motivated by the desired to render the surface of the second nonwoven polyolefin substrate hydrophilic”. Applicants disagree.

The Examiner is using Applicant’s own disclosure to provide the requisite motivation as Koubek et al. do not teach or suggest the desirability. To the extent that Koubek et al. require a hydrophilic nonwoven substrate, the reference itself provides it in the form of cellulose, which are naturally hydrophilic. Even if one were to make the impermissible combination with Temperante et al, the combination provides another source – the polymer melt additives in which the reference surfactant are added to the molten polymer. The combination would yield a nonwoven having a surfactant incorporated as a polymer melt additive. Further, while Temperante et al. teach the desirability of a hydrophilic top sheet in diaper construction, the hydrophilicity is imparted by the addition of the reference surfactant blend to the molten thermoplastic polymer, not from an adjacent adhesive layer.

Further, the Examiner notes “differences in concentration will not support the patentability of the subject matter... unless there is evidence indicating such concentration is critical or provides unexpected results”. Applicants have provided the requisite unexpected results; that a surfactant added to the adhesive layer will migrate to render an adjacent polymer film surface hydrophilic.

Claim 12 specifically recites the adhesive comprises 5 to 40 wt.% of the fluorochemical surfactant, a range *outside* of the reference range. At Temperante column 8, lines 12 to 32 it teaches that the blend of fluorochemical and non-fluorinated surfactants comprise 0.2 to 5.0 % by weight of the thermoplastic polymer, and the ratio of the fluorochemical and non-fluorinated surfactants is 9:1 to 1:9. Therefore the amount of fluorochemical surfactant in Temperante et al. is 0.02 to 4.5 %, under the 5% lower limit of claim 12. The Office Action provides no reasoning for exceeding the range of the reference.

The rejection of claims 1, 5-7, and 11-15 under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,625 (Temperante et al.) has been overcome and should be withdrawn.

Claims 1 and 13-15 stands rejected under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,519 (Riswick et al.). The rejection is traversed.

As previously argued, Koubek et al. is directed to a water-borne, water-redispersible adhesives, notably styrene/acrylic acid copolymers, prepared by emulsion polymerization of the recited monomers in the presence of starch degradation products. The adhesive is useful for bonding a nonwoven substrate to a second substrate. At column 7, lines 13-25, the reference teaches that it may be desirable to add a surfactant to the adhesive “at conventional levels”. The reference provides no reason for the addition, and no guidance on what defines “conventional levels”, and no suggesting that the surfactants would migrate in the reference article, nor that the surfactant, upon migration, would then impart a hydrophilic surface to the reference nonwoven substrate layer. Here, the Office Action relies on Applicant’s own teachings of migratory surfactants to impermissibly make the rejection.

Again, claim 1 may be distinguished from Koubek et al. first in the limitation of “a nonionic fluorochemical surfactant”, which the Office Action notes is neither taught nor suggested by the reference. To correct the deficiency, the Office Action relies on Riswick et al.

Although the Office Actions asserts “it would be obvious... to add the fluorochemical surfactant of Riswick to the adhesive of Koubek, motivated by the desire to provide a durable bond to the send substrate, the suggested combination is without merit. Riswick et al is devoted to a hot-melt adhesive, in which substrates are bonded with a molten adhesive composition. Koubek et al is devoted to a water-dispersible adhesive, as taught in column 2, lines 48 to 50. Further, at column 6, lines 24 to 35, the references notes that the polymer dispersions prepared by emulsion polymerization may be used directly, the polymer may first be dried, and then redispersed. In either embodiment, the reference describes an aqueous dispersion, not a hot-melt. Note that while Riswick et al. state, at column 2, lines 13 to 19, the fluorochemical surfactant “may be added to virtually any hot-melt adhesive”, the water dispersible adhesives of Koubek et al. are not contemplated. One may compare the polymer composition of Riswick et al. from

column 2, line 13 to column 3, line 35 to those of Koubek et al. from column 4, line 27 to column 5, line 7.

In summary, the Office Action suggests a substitution of the “convention surfactants” that may be added to the waier-dispersible adhesive “at conventional levels” of Koubek et al. for the fluorochemical surfactant of Riswick et al., used in a hot melt adhesive, without and teaching or suggestion from either reference, and without acknowledgement that the two are fundamentally different adhesives. It is not apparent whether the nonionic surfactants of Riswick et al. may be added to the adhesives of Koubek et al., while maintaining the necessary water dispersibility. These are distinctly different adhesive composition and there is no indication that the surfactant of Riswick et al. would be suitable for the adhesive of Koubek et al.

With regard to claim 30, at page 10 of the Office Action, the Examiner asserts that “Koubek as modified by Riswick does not explicitly teach the T_g of the adhesive layer...”. This is incorrect. Riswick et al., at column 2, lines 34-35, teach that the block copolymers should have a glass transition temperature above 20°C. Claim 30 has been amended to include the limitation that the instant adhesives have a T_g of less than 0°C.

In support of the rejection, the Examiner asserts that as the two references share the same utility, such as wipes, the “hot melt adhesive of Koubek and modified by Riswick would necessarily have a T_g at or below 25°C...”. The Examiner is confusing desired end uses with the purported benefits of the reference invention. Koubek et al. provides a water dispersible adhesive containing starch degradation products. Riswick et al provide a hot melt adhesive have improved strike-through. The objectives of each reference, and the means of obtaining those stated objectives, are different.

There is no teaching or suggestion in either reference for the desirability of rendering the reference nonwoven substrate layer, or the second substrate layer, hydrophilic. Again, in making the rejection, the Examiner overlooks the burden required by M.P.E.P. 2143.01; that “the prior art must suggest the desirability of the claimed invention”.

In further support of the rejection, the Office Action admits that “Koubek as modified by Riswick is silent as the teaching of water contact angles of less than 90°, and the migration of a nonionic fluorochemical surfactant to the first polymer layer as claimed”, but “it is reasonable to assume that the laminating adhesive coated second substrate of Koubek as modified by Riswick

necessarily has a water contact angle of less than 90° and the migration of a nonionic fluorochemical surfactant because like martial has like property”.

The Examiner is making a conclusory statement without supported reasoning, and appears to be arguing a rejection based on inherency. M.P.E.P. 2112 states:

“To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a give set of circumstances is not sufficient.’ ” *In re Robertson*, 169 F.3d 743, 745 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

In the present Office Action, the rejection assumes that any surfactant added to an adhesive will inherently migrate to an adjacent polymer layer, and inherently render it hydrophilic. In asserting that migration will necessarily result in the article of Koubek et al as modified by Riswick et al., the Office Action ignores that the two adhesive combinations are fundamentally different, as previously argued.

Claims 1, 16, 19 and 20 stand rejected under 35 USC § 103(a) as being unpatentable over U.S. 6,503,620 (Xie et al.) in view of U.S. 5,804,519 (Riswick et al). The rejection is traversed.

Xie et al. describes a multilayer, pressure-sensitive article, such as label stock having a) a composite pressure sensitive adhesive (psa) containing filler particles, b) a second psa containing less or no filler, and c) a facestock. At column 13, the reference states, in its’ entirety, “[c]utting agents such as waxes and surfactants can also be included in the adhesives”.

Claim 1 may first be distinguished form the reference by the limitation of the nonionic fluorochemical surfactant, as noted in the Office Action. To correct the defect, the Office Action refers to Riswick et al. The motivation is asserted to be “a desire to provide a durable bond between the facestock and the psa”. Applicants disagree with the purported motivation. There is no such motivation, and the entire disclosure of Xie et al. is directed to a stable bond between the adhesive and facestock, and between the adhesive and ultimate substrate. The reference states, and column 2, lines 1 to 7 that fillers are often added to adhesives, but at column 2, lines 31-38, it states that such fillers may cause loss of tack. Therefore, Xie et al. discloses a multilayer

adhesive to overcome these problems. See column 3, lines 55 to 67. The alleged motivation to combine the references has already been addressed by the reference invention, which precludes the motivation suggested in the Office Action.

Riswick is devoted to an adhesive/nonwoven construction where the improved 'strike-through' properties facilitate transport of liquids from the porous nonwoven layer (such as would be found adjacent the body in a diaper construction) to an adjacent absorbent layer. Xie is devoted to a label construction. The benefits of strike-through to the labels of Xie are contraindicated, as one does not wish for ink imprinted on the facestock to be conveyed through the facestock and adhesive layers. Further, the facestock of Xie is non-porous, as one would clearly wish the ink to remain on the surface thereof.

Like Riswick et al., Xie et al. are entirely silent as to the desirability of rendering the facestock hydrophilic. Xie et al. characterize surfactants, along with waxes, as "cutting agents", which are used to reduce the aggressiveness of adhesives. Where one to select a surfactant for the adhesive layers of Xie et al., it would be on that basis – one that would reduce the tack or peel strength of the recited adhesives. There is no indication that the surfactants of Riswick et al. would be suitable as "cutting agents". The purported combination is without merit.

Claim 1 may further be distinguished from the purported combination by the limitation of "film". Although Xie et al. has a lengthy disclosure of films (from column 13, line 44 to column 16, line 15), Riswick et al. do not contemplate films. To apply the strike-through properties of Riswick (which seeks to transmit liquids) to the labels of Xie (in which liquid inks are retained on the surface) is contraindicated as the labels of Xie et al. could not possibly benefit from strike-through.

It is further apparent that neither reference teaches or suggests the desirability of rendering the porous nonwovens of Riswick et al. or the facestocks of Xie et al. hydrophilic, or the means to achieve the hydrophilicity. There is also no teaching or suggestion that the surfactants of either reference migrate, nor the desirability of such migration. Again, the Examiner has relied upon Applicant's own teachings to provide the necessary motivation to combine unrelated references upon seemingly spurious grounds.

In summary, the rejection of claims 1, 16, 19 and 20 under 35 USC § 103(a) as being unpatentable over U.S. 6,503,620 (Xie et al.) in view of U.S. 5,804,519 (Riswick et al) has been overcome and should be withdrawn.

Claims 18 and 22 stand rejected under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,519 (Riswick et al.) and further in view of U.S. 5,514,120 (Johnstone et al.). The rejection is traversed.

Claim 1 is patentable in view of Koubek et al. and Riswick et al., alone or in combination for the reasons argued *supra*. Claims 18 and 22 and both directed to patterned surfaces on Applicants thermoplastic film layer. While one may be motivated to "provide liquid management member [of Johnstone] as the second substrate of Koubek", the reference still fails to correct the defects of Koubek et al. and Riswick et al. Further Johnstone et al., like Temperante et al., describe articles on which a surfactant is incorporated into the thermoplastic polymer (as a polymer melt additive); a conventional means over which the present invention improves upon by providing an adhesive reservoir containing a nonionic fluorochemical surfactant, that migrates to an adjacent film layer to render it hydrophilic and continually replenish the surfactant.

In summary, the rejection of Claims 18 and 22 under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,519 (Riswick et al.) and further in view of U.S. 5,514,120 (Johnstone et al.) has been overcome and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested. Allowance of claims 1, 5-7, 11-20, 22-24, 29 and 30, as amended, at an early date is solicited.

Respectfully submitted,

Date

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